STATUS OF THE CLAIMS

Claims 1 – 75. (canceled)

76. (currently amended) A method of *in situ* or *in vivo* imaging, comprising:

a) providing cells, a chimeric polypeptide, and an imaging agent; wherein said cells possess or are suspected of possessing polypeptides comprising RGD motifs; wherein said cells comprise tumor cells; wherein said tumor cells are undergoing neovascularization; wherein said chimeric polypeptide comprises an illumination domain, and a target recognition domain; wherein said illumination domain comprises a luciferase protein; wherein said target recognition domain comprises an RGD sequence; wherein said RGD sequence is SEQ ID NO: 1; wherein said imaging agent is luciferin;

b) administering said chimeric polypeptide to said cells;

c) administering said imaging agent to said cells; and

e) measuring the activity of said illumination domain by detecting signal from said illumination domain.

77-79. (canceled)

80. (currently amended) A method of *in situ* or *in vivo* imaging, comprising:

a) providing cells, a chimeric polypeptide, and an imaging agent; wherein said cells possess or are suspected of possessing polypeptides comprising RGD motifs; wherein said cells comprise tumor cells; wherein said tumor cells are undergoing neovascularization; wherein said chimeric polypeptide comprises an illumination domain, and a target recognition domain; wherein said illumination domain comprises a bioluminescent polypeptide; wherein said target recognition domain comprises an RGD sequence; wherein said RGD sequence is SEQ ID NO: 1;

b) administering said chimeric polypeptide to said cells;

c) administering said imaging agent to said cells; and

e) measuring the activity of said illumination domain by detecting signal from said illumination domain.

81. (canceled).

82. (previously presented) The method of Claim 80, wherein said bioluminescent polypeptide comprises luciferase.

83. (previously presented) The method of Claim 80, wherein said bioluminescent polypeptide comprises a polypeptide selected from the group consisting of luciferase, aequorin, halistaurin, phialidin, obelin, mnemiopsin, and berovin.

84. (previously presented) The method of Claim 80, wherein said imaging agent is luciferin.

85-86. (canceled)

87. (currently amended) A method of *in situ* or *in vivo* imaging, comprising:

a) providing cells, a chimeric polypeptide, and an imaging agent; wherein said cells possess or are suspected of possessing polypeptides comprising RGD motifs; wherein said cells comprise tumor cells; wherein said tumor cells are undergoing neovascularization; wherein said chimeric polypeptide comprises an illumination domain, and a target recognition domain; wherein said illumination domain comprises a ~~luciferin~~luciferase; wherein said target recognition domain comprises an RGD sequence; wherein said imaging agent is luciferin;

b) administering said chimeric polypeptide to said cells;

c) administering said imaging agent to said cells; and

e) measuring the activity of said illumination domain by detecting signal from said illumination domain.

88-90. (canceled)

91. (currently amended) The method of Claim 87, wherein said ~~said~~ RGD sequence is SEQ ID NO: 1.

92. (currently amended) A method of *in situ* or *in vivo* imaging, comprising:

a) providing cells, a chimeric polypeptide, and an imaging agent; wherein said cells possess or are suspected of possessing polypeptides comprising RGD motifs; wherein said cells comprise tumor cells; wherein said tumor cells are undergoing neovascularization; wherein said chimeric polypeptide comprises an illumination domain, and a target recognition domain; wherein said illumination domain comprises a bioluminescent polypeptide; wherein said target recognition domain comprises an RGD sequence;

b) administering said chimeric polypeptide to said cells;

c) administering said imaging agent to said cells; and

e) measuring the activity of said illumination domain by detecting signal from said illumination domain.

93-95. (canceled)

96. (previously presented) The method of Claim 92, wherein said bioluminescent polypeptide comprises luciferase.

97. (previously presented) The method of Claim 92, wherein said bioluminescent polypeptide comprises a polypeptide selected from the group consisting of luciferase, aequorin, halistaurin, phialidin, obelin, mnemiopsin, and berovin.

98. (previously presented) The method of Claim 92, wherein said RGD sequence is SEQ ID NO: 1.